


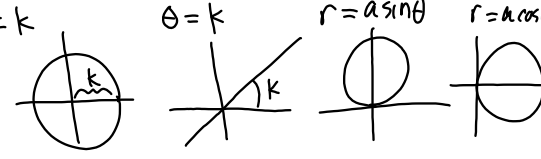
Review 29 polar coords



(x, y) $x = r \cos \theta$ $r = \sqrt{x^2 + y^2}$
 (r, θ) $y = r \sin \theta$ $\theta = \tan^{-1} \frac{y}{x}$
 add π if
 in Q II or Q III

basic graphs

$r = k$ $\theta = k$ $r = a \sin \theta$ $r = a \cos \theta$

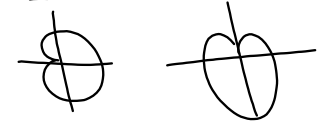


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leafed rose

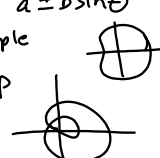
$r = a \sin(n\theta)$ $r = a \cos(n\theta)$
 n even $2n$ petals $0 \leq \theta \leq 2\pi$
 n odd n petals $0 \leq \theta \leq \pi$

cardioids $r = a \pm a \cos \theta$ $r = a \pm a \sin \theta$



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$r = a \pm b \cos \theta$ $r = a \pm b \sin \theta$
 limaçon \leftarrow dimple \rightarrow loop



area $r = \int_{\theta_1}^{\theta_2} \frac{1}{2} r^2 d\theta$

between 2 curves $\int_{\theta_1}^{\theta_2} \frac{1}{2} R^2 - \frac{1}{2} r^2 d\theta$

R - further from origin

θ_1, θ_2 : intersection pts

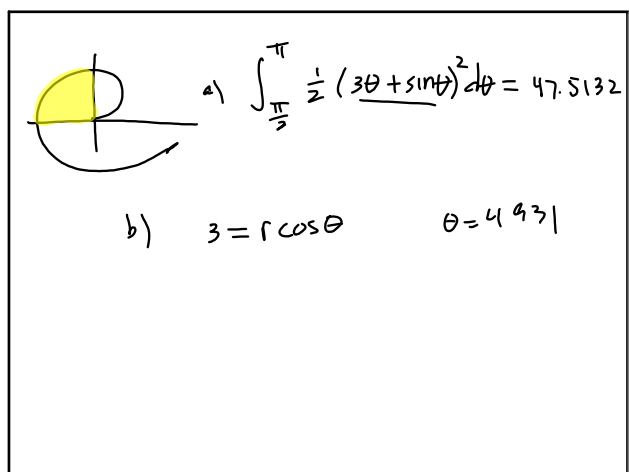
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EX. 1 $r = 3\theta + \sin \theta$ $0 \leq \theta \leq 2\pi$

a) Find the area in the second quadrant enclosed by axes & the curve r

b) A point on the curve has an x -coord of 3. Find θ , Find y

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